Vol. 109. Part 4. Pp. 135–148. 1 fig. 2 plates. 15th August, 1957.

COMMONWEALTH INST.
ENTOMOLOGY LIBRARY
16 AUG 1957
Eu. 3 H+
SEPARATE

THE

TRANSACTIONS

OF THE

ROYAL ENTOMOLOGICAL SOCIETY

OF

LONDON

World List abbreviation: *Trans. R. ent. Soc. Lond.*

CONTENTS

PAGE

BLASDALE, P. The Asilidae (Diptera) of the Genus *Philodicus* Loew in the Ethiopian Region. . . . . 135–148, 1 fig. 2 plates.

LONDON:
PUBLISHED BY THE SOCIETY AND
SOLD AT ITS ROOMS, 41, QUEEN'S GATE, S.W.7.

Price 6s. 0d.

THE ROYAL ENTOMOLOGICAL SOCIETY OF LONDON

Founded 1833. Incorporated by Royal Charter 1885.

Patron:

HER MAJESTY THE QUEEN.

OFFICERS AND COUNCIL FOR THE SESSION, 1957-1958.

PROF. O. W. RICHARDS, *President.*

MR. P. FREEMAN
DR. W. J. HALL, C.M.G., M.C. } *Vice-Presidents.*
MR. W. V. HARRIS

DR. N. E. HICKIN, *Treasurer.*
MR. E. B. BRITTON, *Secretary.*
MR. W. H. POTTS, *Editor.*

Other Members of Council.

MR. J. BALFOUR-BROWNE.
MR. C. T. GIMINGHAM, O.B.E.
DR. H. E. HINTON.
DR. B. M. HOBBY.
MR. T. G. HOWARTH.
DR. H. B. N. HYNES.
MISS D. J. JACKSON.
DR. A. M. MASSEE, O.B.E.
MR. H. L. G. STROYAN.
MR. H. B. WILLIAMS, Q.C.

MISS E. EVANS, *Registrar.*

Finance and House Committee.

MR. W. V. HARRIS (Chairman).

DR. J. R. BUSVINE.
MR. C. T. GIMINGHAM, O.B.E.
DR. W. F. JEPSON, O.B.E.
MR. A. T. THOMPSON.
DR. I. H. H. YARROW.

Publication and Library Committee.

MR. PAUL FREEMAN (Chairman).

MR. R. F. BRETHERTON, C.B.
DR. J. L. CLOUDSLEY-THOMPSON.
DR. W. J. HALL, C.M.G., M.C.
DR. B. M. HOBBY.
MR. H. OLDROYD.

Committee for the Protection of British Insects.

MR. H. M. EDELSTEN, O.B.E. (Chairman).

MR. R. B. BENSON.
MR. R. F BRETHERTON, C.B.
LIEUT.-COL. C. A. W. DUFFIELD, M.C., J.P.
DR. B. M. HOBBY (*and representing the Society for British Entomology*).
CAPT. R. A. JACKSON, C.B.E., R.N.
LIEUT.-COL. W. B. L. MANLEY.
DR. A. M. MASSEE, O.B.E.
MR. A. ROEBUCK, O.B.E., N.D.A.
MR. N. D. RILEY, C.B.E. (Secretary).

The Executive Officers of the Society are *ex-officio* members of all Committees.

DELEGATES OF THE SOCIETY TO:

1. **British National Committee for Biology** (Royal Society)
   Prof. G. C. Varley, appointed 1952.
   Mr. N. D. Riley, C.B.E., appointed 1955.
2. **Local Committee of Management of Wicken Fen.**
   Mr. H. M. Edelsten. O.B.E. (nominated by Committee for the Protection of British Insects).
3. **National Trust for Places of Historic Interest or Natural Beauty.**
   Mr. N. D. Riley, C.B.E., appointed 1955.
4. **New Forest Association.**
   Mr. C. W. Mackworth-Praed, appointed 1948.
5. **New Forest Joint Committee.**
   Lt.-Col. F. C. Fraser, appointed 1949.
6. **Council for the Promotion of Field Studies.**
   Dr. W. H. Thorpe, F.R.S., appointed 1944.
7. **Joint Bioclimatic Committee.**
   Dr. B. P. Uvarov, C.M.G., F.R.S., appointed 1945.
   Dr. C. B. Williams, F.R.S., appointed 1945.
8. **Yorkshire Naturalists' Trust, Ltd.**
   Dr. W. D. Hincks, appointed 1946.
9. **The Biological Council.**
   Dr. N. E. Hickin, appointed 1952.
10. **The Parliamentary and Scientific Committee.**
    Dr. N. E. Hickin, appointed 1953.
11. **British Co-ordinating Committee for Nature Conservation.**
    Mr. E. B. Britton, appointed 1954.

THE ASILIDAE (DIPTERA) OF THE GENUS *PHILODICUS* LOEW IN THE ETHIOPIAN REGION.

By P. Blasdale.

Manuscript received 3rd October, 1956.

(Read 5th December, 1956.)

With 2 Plates and 1 Text figure.

Contents.

		PAGE
I.	Introduction and Acknowledgments	135
II.	Key to the Ethiopian species of *Philodicus* Loew	136
III.	The *alcimoides* group	137
IV.	The *fraternus* group	140
V.	Summary	147
VI.	References	148

I. Introduction and Acknowledgments.

The genus *Philodicus* was erected by Loew in 1848, and admirably distinguished by him from the related genera *Promachus* and *Alcimus*, the distinction being based on the same venational character that is used to-day. Before this, Wiedemann (1828) had included such species as he recognised, i.e. *P. ludens* and *P. fraternus* from the region now under consideration, in the Fabrician genus *Asilus*; Macquart (1839) had coined the invalid name *Trupanea* to include all three of the above genera. After Loew's work, Walker began (1849) by using *Asilus* and later (1851, 1855) adopted *Trupanea*; Bigot recognised *Philodicus* but unaccountably retained *Trupanea* for *Erax completus* Macquart. Even recently there has been some confusion; most of the species of *Philodicus* have been called *Alcimus* at some time or other, and a glance at Kertesz's *Catalogue* (1909) shows, of the names used in the present study, five as *Alcimus*, three as *Promachus* and four as *Philodicus*. The synonyms of *P. temerarius* (Walker) appear in all three genera. I have checked the original descriptions of all *Promachus* and *Alcimus* species from the Ethiopian region, and hope that I have succeeded in picking out all the misplaced *Philodicus* species.

I have been fortunate in seeing either types or author's material of all species of the genus except *P. doris* (Curran) and *P. pavesii* Bezzi, which are lost. It is nevertheless regrettable that the amount of material available was small, as time did not permit a thorough exploration of the resources of the many African museums. The key given is, therefore, rather unsatisfactory, the more so because there is a surprising lack of clearly-defined characters, but identification by examination of the male or female terminalia is both simple and reliable. The figures given will be found to be self-explanatory as soon as a specimen is inspected.

The scope of this study is limited to such members of this widespread genus as occur in the Ethiopian region of Africa. The notes on distribution are based entirely on material that I have seen, with the exception of Dr. Curran's specimens of *doris* and *temerarius* (*biseriatus* Curran).

My sincere thanks are due to Professor G. C. Varley for allowing me to work in the Hope Department of Entomology, Oxford, and to Dr. B. M. Hobby and Mr. H. Oldroyd for their kind and patient help. I am grateful also to the Curators of all the museums mentioned for their generous co-operation in lending type material.

II. Key to the Ethiopian Species of *Philodicus* Loew.

1 Antennae with style more than twice as long as third segment; fore femora without anterior and posterior bristles (male entirely without, female usually with a few ventral) 2
Antennae with style approximately equal in length to third segment; fore femora with a short stout bristle on the anterior, and at least one on the posterior, side 7

alcimoides Group.

2 [Wing shading absent . . . . . **pavesii** Bezzi]
Wing tips shaded with brownish or greyish 3
3 Palpi reddish- or yellowish-brown 4
Palpi with at least the basal half black or almost black 5
4 Thoracic stripes strong and dark, abdominal segments with dense blackish bands . . . . . **dubius** Ricardo
Thoracic stripes weak and pale, abdomen almost unmarked **pallidus** sp. n.
5 Wing shading extending to M_2 . . . . . **alcimoides** sp. n.
Wing shading not extending beyond R_5 6
6 Humeri with white hairs only . . . . . **gracilis** v. d. Wulp
Humeri with some black hairs mixed with the white . . **tenuipes** Loew **cinerascens** (Ricardo)

fraternus Group.

7 Wing shading extending beyond M_2 8
Wing shading not extending beyond M_2, except occasional traces along veins 11
8 Wing shading not extending beyond M_3 . . . . . **nigrescens** Ricardo
Wing shading extending along posterior edge of wing 9
9 Abdomen without black bristles 10
Abdomen with some black bristles on at least first segment **temerarius** (Walker)
10 Legs black . . . . . **furunculus** sp. n.
Legs yellow . . . . . **ludens** (Wiedemann)
11 Palpi yellow or brown 12
Palpi black or almost black 14
12 Abdomen with second segment approximately square 13
Abdomen with second segment distinctly broader than long **robustus** sp. n.
13 Apparent base of R_4 approximately equidistant from both cross-veins **yirolensis** sp. n.
Apparent base of R_4 much nearer to cross-vein 2 than to 1 . **palustris** sp. n.

14 Fore femora black or indistinctly reddish ventrally 15
Fore femora distinctly yellowish or reddish posteroventrally . . . 16
15 Thorax with all three lateral spots equally distinct 17
Thorax with anterior lateral spot much less distinct than the other two **doris** (Curran)
16 Abdominal segments darker medially, with a large patch of black hairs . . . . . **nigripes** Ricardo
Abdominal segments darker laterally, few or no black hairs; or in very dark specimens, where black hairs may be present, a patch of whitish hairs medially . . . . . **swynnertoni** Hobby
17 Wing shading in cell M_1 extending to half the length of the cell . . 18
Wing shading in cell M_1 limited to a narrow marginal band and a streak near M_2 . . . . . **fraterculus** (Walker)
18 Abdomen with all whitish hair dorsally . . . . . **flavipes** sp. n.
Abdomen with some black hair dorsally 19
19 Abdominal segments with black hairs on anterior part . . **doris** (Curran)
Abdominal segments with black hairs on posterior part **fraternus** (Wiedemann)

III. The *alcimoides* Group.

The first seven species to be dealt with have a number of characters in common, making it convenient to distinguish them as a species group within the genus. The antennae have a very short third segment, less than half the length of the style; the bristles throughout the body tend to be less stout and abundant, and the fine hairs longer and more abundant than the average for the genus; wing shading, except in the case of *P. alcimoides* itself, extends no further round the apex of the wing than R_5; the male claspers tend to be rather simple in form, and the eighth sternite of the female is very characteristically broad, flat, and longitudinally ribbed. In the field it may be noted that the lateral spots of the thorax are lightly marked and "streaky", and the slender abdomen shows a "chequered" pattern in certain lights. (This last character may be seen in some other species of the genus, but not so conspicuously).

In all these characters there is a resemblance to the related genus *Alcimus* Loew; indeed, were it not for the diagnostic wing venation they might at first sight be confused with some of the smaller species of the latter genus.

Philodicus alcimoides sp. n.

Alcimus fraternus Curran, 1927, *Amer. Mus. Novit.* **272**: 15. *Nec* Wiedemann, 1819.

Slender, greyish-brown to grey; thoracic markings indistinct; palpi dark reddish-black; wing shading extending to M_2. Length 16–22 mm., wing 10–14 mm.

Holotype, length 19·5 mm., wing 13 mm.

Head.—Black, reddish in the region of the antennae; tomentum glossy silver on face, light gold on vertex, silver ventrally and gold dorsally on occiput; genae clothed in tomentum to their ventral tip, *i.e.* no bare patch above palpi; vibrissae pale yellow; facials white, long and slender; frontals pale yellow, slender; postorbitals yellow, 2 black each side in the region of the medial border of the eye; beard white. Antennae: segment 3 about half the length of the style, slightly longer than 1; segments 1 and 2 black, reddish at their apices, 3 black, reddish at base and apex, style reddish-brown, yellow at extreme tip; segments 1, 2, and 3 with greyish-yellow tomentum; segments 1 and 2 with mixed black and light yellow bristles, the black less numerous on 1. Palpi very dark reddish-black with pale yellowish hairs.

Thorax.—Pronotum black with pale gold tomentum, bristles all yellow; mesonotum black, humeral calli light red, post-alar calli dark red; pleurites light and dark red except the dorsal half and ventral quarter of the mesothoracic sclerites, which are black; tomentum mostly yellowish-grey, centre stripes indistinctly divided, forming a broad brownish-grey band; lateral spots indistinctly grey, only the very small posterior one at all distinct; some streaky dark marks apparent in the anterior half of the disc are effects of the light on uniformly-coloured tomentum; pubescence in the centre of the disc short and black, elsewhere, including humeral calli, pale yellowish-white, long and abundant; dorsal bristles all black, metapleurals yellow; no bristles on the articular sclerite of the wing, but a tuft of whitish hairs.

Legs.—Reddish-yellow, the anterior half of coxae and femora, and an anteroventral line, broadening distally, on the tibiae, black; pubescence white, on fore tibiae longer than the bristles; bristles preponderantly yellow, except on the hind tarsi where they are mostly black.

Wings.—Veins reddish-yellow to dark brown; membrane almost clear, slightly yellowish about the veins; grey shading distinct, ending proximally at a line between the end of M_2 and a point on the costal edge about one-third of the length of the wing from the tip, but passing beyond this line where it crosses the veins and at the posterior edge.

Abdomen.—Each segment black on the disc, red laterally and posteriorly; sternites red; tomentum almost uniform greyish-yellow, slightly darker on the disc; pubescence long, yellowish-white, some black medially on the anterior half of each segment; bristles yellow, on the anterior six segments; claspers red, darkening to brown dorsally, ventral and posterior edges black.

Holotype ♂, *allotype* ♀, SUDAN: Equatoria Province, Lesi on the River Yei, about 40 miles north of Amadi, 25.v.1954 (*P. Blasdale*). Hope Department, University Museum, Oxford.

Paratypes, ♂, ♀, GOLD COAST: Yapi, xi.1916 (*J. J. Simpson*). ♂, ♀, SIERRA LEONE: Freetown, 1940 (*C. R. Ribbands*). British Museum (Nat. Hist.).

Before the characters of its species group are investigated, *P. alcimoides* may be easily confused with *P. fraternus* (Wied.), *P. yirolensis* sp. n. and *P. palustris* sp. n. The *fraternus* series in the British Museum was found to contain as many specimens of this as of the correct species.

It is a slim, greyish fly, inhabiting open sandy ground. I have found it on a river sandbank where it was virtually impossible to see unless first detected by ear in its buzzing flight. The female is a more sustained flier than the male, and consequently much more difficult to capture.

The distribution (Sierra Leone, Liberia, N. Gold Coast, Dahomey, W. and N. Nigeria, S. Sudan) lies within the savannah belt extending across Africa from the west coast to the Nile between the latitudes 15° and 5° N. There is a gap, represented by French Equatorial Africa, but no doubt this is due merely to a deficiency of information. There is also a single anomalous specimen in the British Museum (Nat. Hist.) from Tokar, near the Red Sea coast of the Sudan.

Philodicus gracilis van der Wulp.

Philodicus gracilis van der Wulp, 1899, *Trans. ent. Soc. Lond.* **1899**: 92.
Philodicus gracilis Ricardo, 1921, *Ann. Mag. nat. Hist.* (9) **8**: 179.

Syntypic series, 2 ♂, 2 ♀, 15 miles north of Aden, 6–23.iii.1895 (*J. W. Yerbury*). Hope Department, University Museum, Oxford.

A very delicate greyish species of average size for the group; length 20–23·5 mm., wing 11·5–15 mm.

It may be distinguished from *P. cinerascens* (Ric.) and *P. tenuipes* Loew by the absence of black hairs on the humeral calli and the less distinct apical shading of the wings.

It appears to be an inhabitant of desert scrub; all the specimens that I have seen are from Arabia.

Philodicus cinerascens (Ricardo).

Alcimus cinerascens Ricardo, 1900, *Ann. Mag. nat. Hist.* (7) **6** : 179.
Philodicus umbripennis Ricardo, 1921, *Ann. Mag. nat. Hist.* (9) **8** : 184.

Resembling *P. gracilis*, and of about the same size (length 18–22·5 mm., wing 10·5–14 mm.) but a rather warmer brown in colour, and with black hairs on the humeri.

Syntypes ♂ and ♀, NYASALAND: Fort Johnston, not dated (*P. Rendall*). British Museum (Nat. Hist.).

Philodicus tenuipes Loew.

Philodicus tenuipes Loew, 1857, *K. Svenska. VetenskAkad. Handl.* **14** : 361; 1860, *Dipt.-Fauna Südafrika's* **1** : 140.

Type, ♀, "Caffraria". Naturhistoriska Riksmuseum, Stockholm.

I am not altogether confident that this species is distinct from *P. cinerascens*; I have examined material ranging from Tanganyika to Cape Province and can find no constant character which separates them, except in the terminalia of both sexes. On this basis the range can be split into two, with *P. cinerascens* in Tanganyika, Nyasaland and the northern parts of Mozambique and Northern Rhodesia; and the other material from Southern Rhodesia, Pretoria, Cape Colony and South-West Africa. I have made these data the basis of two assumptions: firstly that all the specimens in the southern half belong to one species, although I have not seen a male and female taken from the same locality; and secondly that they are *P. tenuipes*, although the unique type of this species, a female from Cape Province, has its eighth abdominal sternite broken.

On the basis of these assumptions, it may be said that *P. tenuipes* inhabits temperate grassland and scrub south of latitude 20° S., and *P. cinerascens* occurs in the tropical grassland and savannah east of the Rift Valley.

Philodicus dubius Ricardo.

Philodicus dubius Ricardo, 1921, *Ann. Mag. nat. Hist.* (7) **6** : 176.

P. dubius is the largest species of the *alcimoides* group (length 25–32 mm., wing 17–19·5 mm.), and recognisable by this character alone; the thorax is very boldly marked in yellow and light and dark brown, and the heavily-banded abdomen hardly shows the "chequered" light effects typical of the group.

Syntypes ♂ and ♀, ZULULAND: M'fongosi. South African Museum, Capetown.

Other specimens seen, from Lake Nyasa, Nyasaland.

Philodicus pallidus sp. n.

Pale and indistinctly marked, with most of the bristles and hairs, except those on the mesothorax, white. Apical shading of the wing tips very much restricted.

Holotype, length 24 mm., wing 15 mm.

Ground colour wholly reddish-yellow, with reddish-black on the vertex and abdominal

tergites, and black on the disc of the mesothorax, proboscis, and anterior sides of the femora.

Head.—Silvery yellowish-white tomentum, more distinctly yellowish on the vertex; vibrissae white, one black bristle on each side; facials white, well developed; frontals white; postorbitals yellowish-white; white hairs on the ocellar tubercle, some very fine black ones behind. Ventral tips of the genae shining reddish. Palpi dark reddish-yellow with yellowish hairs. Antennae: first 2 segments reddish-yellow with white bristles and an occasional black one; third segment missing.

Thorax.—Pronotum with whitish tomentum, and flowing white hairs laterally; bristles yellowish-white. Mesonotum with the centre stripes dark brown on a light brown band, the posterior third edged with silvery-whitish; lateral spots obsolete, except the posterior one which is small and sooty; black pubescence is confined to the disc.

Legs.—Yellow, all femora black anterodorsally, hind tibiae with a dark red anterodorsal stripe, all tarsi darkening to reddish distally. Bristles mostly white on the femora, approximately equally white and black elsewhere.

Wings.—Veins reddish-yellow to yellow; membrane very lightly tinged with yellowish; apical shading present as a narrow distal band extending to R_5, and small spots in cells R_5, M_1 and M_2.

Abdomen.—Tomentum yellowish-white with a diagonal brown streak at the lateral borders of the tergites; all pubescence white, white bristles at the posterolateral corners of the anterior 6 segments.

Holotype ♂, SOMALILAND, not dated (*Greenfield*). British Museum (Nat. Hist.).

Philodicus pavesii Bezzi.

Philodicus pavesii Bezzi, 1892, *Ann. Mus. Stor. nat. Genova* (2) **12**: 185.

The types of this species in the Milan Museum appear to have been destroyed during the war, but Bezzi's description is quite full and should permit of easy recognition of the species.

Bezzi describes the antennal style as long, and the fore femora as lacking bristles; the species is therefore tentatively placed in the *alcimoides* group.

It appears to be a medium-sized insect, about the size of *P. fraternus*, grey in general appearance with black femora and all white bristles except those on the mesonotum and some on the tarsi; the wings have curious venation in that R_5 is curved strongly posteriorly, approaching M_1 distally—in one wing of one specimen the two veins actually join; grey apical shading is absent.

IV. THE *fraternus* GROUP.

This comprises all the "typical" *Philodicus* species, and may be somewhat negatively defined as those species that do not belong to the *alcimoides* group.

Philodicus fraternus (Wiedemann).

Asilus fraternus Wiedemann, 1819, *Zool. Mag.* **1** (3): 33; 1821, *Dipt. Exot.*: 206; 1828 *Aussereurop. Zweifl. Ins.* **1**: 496.
Asilus fraternus Walker, 1849, *List Dipt. Brit. Mus.* **2**: 396.
Trupanea fraternus Walker, 1855, *List Dipt. Brit. Mus.* **7** Suppl. 3: 597.
Philodicus fraternus Bigot, 1858, *in* Thomson *Arch. Ent.* **2**: 355.
Trupanea limbata Macquart, 1839, *Dipt. Exot.* **1** (2): 95. *Apd.* Bigot in coll., **syn. nov.**
Asilus turinus Walker, 1849, *List Dipt. Brit. Mus.* **2**: 407, **syn. nov.**
Trupanea turinus Walker, 1855, *List Dipt. Brit. Mus.* **7** Suppl. 3: 597.
Promachus turinus Loew, 1860, *Dipt.-Fauna Südafrika's* **1**: 127.
Philodicus turinus Ricardo, 1921, *Ann. Mag. nat. Hist.* (9) **8**: 181. nec *Alcimus fraternus* Curran, 1927, *Amer. Mus. Novit.* **272**: 18.

A medium-sized greyish-brown species with black and reddish legs, the usual dorsal spots, and wing shading extending to M_2. Length 18–22·5 mm., wing 11–15 mm.

Lectotype ♂, length 21 mm., wing 13·5 mm.

Head.—Black; tomentum yellowish-silver, white on the ventral half of the occiput; vibrissae light yellow with one weak black bristle each side; facials very fine, white; frontals stout, black and yellow; post-orbitals black medially and yellowish laterally in approximately equal numbers. Basal 2 segments of antennae black, slightly reddish, with numerous long stout black bristles; segment 2 about three-quarters the length of 1; [segment 3 (missing on lectotype) black with greyish tomentum, equal in length to 1 + 2; style dark reddish, equal in length to 3]. Palpi black, slightly reddish, with yellowish-white hairs.

Thorax.—Pronotum black with brown tomentum and black bristles, one yellow. Mesonotum black, humeral and post-alar calli and posterior edge of the disc red; tomentum brown and gold, the usual markings sooty and distinct except the anterior lateral spot which is brown and ill-defined; a small dark patch at the base of each of the short black hairs; pubescence black on the disc and humeral calli, white and long at the posterior border and on the scutellum. Pleura reddish, the mesopleura, sternopleura and pteropleura with large black areas; tomentum light grey ventrally, darkening to brown dorsally; pubescence on the dorsal part of the mesopleura yellowish anteriorly, black posteriorly, elsewhere white; bristles yellow.

Legs.—Brownish-yellow, with the anterodorsal face of the femora and an anteroventral line on the tibiae black, the tarsi darkening to reddish distally and posteriorly, so that the basal segment of the fore tarsi is clear yellowish, and the terminal segment of the hind tarsi is dark reddish-black; pubescence yellowish-white, a dorsal line of black hairs on all tibiae; bristles mostly yellowish-white on all coxae, fore and hind femora, mostly black elsewhere, all black on hind tibiae and tarsi.

Wings.—Veins dark red to reddish-brown; membrane very faintly yellow; apical shading fairly dense and extending to M_2. The apparent origin of R_4 much closer to the second cross-vein than to the first. (fig. 1.)

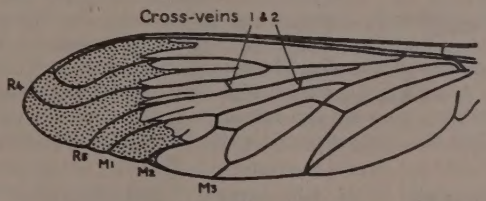


FIG. 1.—*P. fraternus* (Wiedemann). Wing showing the veins referred to in the text.

Abdomen.—Tergites black, light reddish-yellow at the lateral edges; sternites red; tomentum, which is sparse, giving the abdomen a shiny appearance, greyish-yellow laterally and medially, with two large brown patches on each segment but the first which is uniform grey; claspers black, red ventrally, with brown tomentum; bristles yellow, on the anterior seven segments; pubescence yellowish, each segment but the first with a patch of black hairs in the posterior half of each side corresponding to the brown patch of tomentum, these hairs becoming long and stout on the seventh and eighth segments.

Lectotype ♂, "GUINEA". Universitets Zoologiske Museum, Kopenhagen [Selected by author—*Ed.*].

Paratype ♀, as above, but not seen.

Paratype ♂, "GUINEA". Naturhistorisches Museum, Vienna.

P. turinus type ♂, British Museum (Nat. Hist.).

This appears to be a very abundant species in the savannah belt stretching across Africa from Sierra Leone to the Nile, the localities from which I have seen specimens being Sierra Leone, N. Gold Coast, N. and SW. Nigeria, Togoland and the S. Sudan. Where I have seen it in the field it has been flying amongst the tussocks of coarse grass about two feet tall, almost invariably resting on horizontal stems.

Philodicus yirolensis sp. n.

Very closely resembling *P. fraternus*, but distinguished by the colour of the palpi, which are yellowish in their distal two-thirds, the position of the apparent origin of R_4, which is equidistant from the 2 cross-veins, and the form of the male genitalia. Holotype length 18 mm., wing 12 mm.

Holotype ♂, *allotype* ♀, *in cop.*, SUDAN: Bahr-el-Ghazal Province, Yirol, Lakes District, 17.vi.1954 (*P. Blasdale*). Hope Department, University Museum, Oxford.

Paratypes, two ♂, same data.

I have seen no other material of this species except a single specimen in the British Museum (Nat. Hist.) labelled " Gambia ".

P. yirolensis is abundant at the type locality on the sandy areas bordering the grassy drainage lines, very near to the northern edge of the laterite region of the southern Sudan. The insects fly low, and rest on the sand. Unfortunately I mistook them in the field for *P. fraternus*, and so did not secure an adequate series.

Philodicus palustris sp. n.

Very closely resembling *P. fraternus* and *P. yirolensis*, but distinguished from the former by its yellow or brown palpi and from the latter by its venation, the apparent origin of R_4 being distinctly nearer to the second cross-vein than to the first. It is more reddish in general colour and less distinctly marked than either of the other species, and the male genitalia are distinctive; there are also differences to be observed in the female terminalia of these 3 species, but there are not enough specimens available to determine whether they are reliable.

Holotype ♂, *allotype* ♀, *in cop.*, SUDAN: Bahr-el-Ghazal Province, Marol (Nyang Forest) about 50 miles north of Gogrial, Jur River District, 21.xi.1955 (*P. Blasdale*). Hope Department, University Museum, Oxford.

Paratypes, two ♀, same data.

There is a single specimen in the British Museum (Nat. Hist.) from Sobat in the Sudan.

P. palustris inhabits scattered patches of mixed deciduous woodland interspersed with " toc " (seasonally flooded tall-grass areas)—a borderline area between continuous open forest to the south and continuous " toc " to the north. The species was found in a swampy drainage line, flying over the water and resting on grasses or water vegetation.

Philodicus flavipes sp. n.

An old specimen with the tomentum greased and the thorax damaged. When fresh it probably bore a strong resemblance to *P. fraternus*, but was more

greyish in general colour. It is clearly distinguished from all three of the foregoing species by the absence of black pubescence on the abdomen, and by the form of the genitalia.

Holotype, length 18 mm., wing 12 mm.

Description of type as for *P. fraternus*, except:

Head.—Tomentum silver; vibrissae with 3 black bristles on each side; palpi reddish-black, the basal quarter red.

Thorax.—Pronotum with all three of its surviving bristles yellow; mesonotum with the extreme posterior edge of the scutellum red (no dorsal tomentum markings are discernible); pleura with silver tomentum; pubescence on mesopleuron all whitish.

Legs.—Tarsi very little darkened distally, all the basal segments being yellow, and even the hind terminal segment with hardly more than the distal half blackish.

Wings.—Membrane distinctly yellowish.

Abdomen.—(No tomentum markings discernible); all pubescence whitish except a few hairs on the eighth segment, claspers and anal flap black.

Holotype ♂, GOLD COAST (*W. Raddon*). Hope Department, University Museum, Oxford.

Philodicus robustus sp. n.

Greyish-yellow and brown, markings typical of the genus. Legs yellowish and black, palpi reddish. Head narrow relative to the thorax. Abdominal segments after the second very much broader than long. Length 17·5–19·5 mm., wing 12–13 mm.

Holotype, length 18·5 mm., wing 12·5 mm.

Head.—Less than four-fifths as broad as the thorax at its broadest point; black, reddish on the frons; tomentum light gold, paler anterior to the eyes, white on the ventral half of the occiput; vibrissae light yellow with one weak black bristle on each side, facials abundant, yellowish-white (sparser in the allotype), frontals yellow, postorbitals yellow; antennae reddish-black, the apex of segment 1 and the base of 2 red, style brown; segment 1 with a thick ventral tuft of yellow bristles, elsewhere black and yellow bristles scattered equally; palpi dark red with yellowish hairs and yellow terminal bristles.

Thorax.—Pronotum black medially, reddish laterally, with greyish-yellow tomentum; bristles yellow medially to yellowish-white laterally. Mesonotum black, a dark red stripe on each side of the centre line, red on the humeral calli, dark red on and between the postalar calli, scutellum black; tomentum light gold, centre stripes dark brown on a coffee-brown band; anterior lateral spot pale and indistinct, middle spot darker, clearly defined sooty on its lateral edge, posterior spot small, clear sooty black; pubescence black, yellowish-white on and about the 4 calli, with some black also on the humeral calli; bristles all black; pleura red, black patches on mesopleura, sternopleura and hypopleura; tomentum yellowish-grey, pubescence yellowish-white, bristles yellow.

Legs.—Black and reddish-yellow in the usual pattern; pubescence yellow; bristles yellow, a few black on the tibiae and the ventral surface of the tarsi.

Wings.—Veins reddish-yellow to dark brown, membrane faintly yellowish; apical shading dense, extending to M_2.

Abdomen.—Segments very broad, the second being approximately square, the fifth and succeeding ones more than twice as broad as long; tergites black medially, reddish-yellow at the lateral and posterior edges, a dark red patch on each side of the disc, sternites entirely reddish-yellow; tomentum yellowish-grey medially, laterally and posteriorly, brown over the dark red areas of sclerite; pubescence and bristles yellow; claspers shiny black, with sparse greyish-yellow tomentum on the dorsal surface only; hairs yellowish-white to yellow, a few black dorsally.

Holotype ♂, SUDAN: Bahr-el-Ghazal Province, Alel on the Yirol-Aliab road, Lakes District, 21.v.1954 (*P. Blasdale*).

Allotype ♀, Jaming, about 80 miles WSW of the above locality, 19.v.1954 (*P. B.*). Hope Department, University Museum, Oxford.

P. robustus inhabits the low *Combretum* bush growing on the laterite—flat, featureless country with thin soil and laterite gravel, and fine sparse grass; it is completely arid for half the year, the specimens being collected at the beginning of the rains. The insects rest exclusively on the ground and are very wary, especially the males, but their loud buzz is helpful in finding them. The dark central stripe on the pale thorax is conspicuous in the field as a recognition feature. On the pin, the broad abdomen and narrow head distinguish the species from all others.

Philodicus doris (Curran).

Alcimus doris Curran, 1927, *Amer. Mus. Novit.* **272**: 18.

Dr. Curran has informed me that the types of this species cannot be found in the American Museum of Natural History, but with the aid of the published description I have, I hope correctly, identified the species in the material at my disposal; the terminalia drawings are based on Sudan specimens.

A fairly large species, length 18·5—25·5 mm., wing 12·5–16 mm., of much the same general appearance as *P. robustus*, from which it is distinguished by the head being more than four-fifths as broad as the thorax, and by its larger size. It differs from *P. swynnertoni*, which is of comparable size, by its indistinct thoracic markings and much less yellow wings. It tends to vary in general colour from yellowish-brown to almost pure grey, the femora may be yellowish posteroventrally or entirely black, and the bristles are not constant in colour, *e.g.* those on the pronotum may vary from all yellowish to all black.

I have found the species in the Sudan in the light bush of the laterite area. It inhabits clear spaces with thin soil and laterite gravel, resting only on the ground.

P. doris is widely distributed in the grassland and lightly wooded savannah bordering the Tropical Rain Forest on each side of the Equator. The material examined is from Sierra Leone, N. Gold Coast, N. and SW. Nigeria, S. Sudan, Uganda, W. Kenya, N. Rhodesia and S. Nyasaland. The type locality is in the NE. Congo.

Philodicus swynnertoni Hobby.

Philodicus swynertoni Hobby, 1933, *Ent. mon. Mag.* **69**: 109.

A large species, length 20–28 mm., wing 13·5–19·5 mm., with entirely black legs and deep yellow wings. Similar in appearance to *P. doris*, but distinguished by its more slender abdomen, yellower wings, and very distinct thoracic markings.

Holotype ♂, SE. Rhodesia: near Mt. Chirinda, 31.i.1912 (*C. F. M. Swynnerton*). Hope Department, University Museum, Oxford.

Allotype ♀, same data, 28.i.1912.

The distribution is as wide as that of *P. doris* and covers roughly the same regions, but those localities that I have been able to trace are in open grassland. Material examined is from Sierra Leone, N. Gold Coast, S. Nigeria, S. Sudan, Uganda, Kenya, SE. Rhodesia (type locality), and Pretoria. Both *P. doris* and *P. swynnertoni* occur at Kiamosi, Kenya; here the country is varied, including both forest and grassland.

Philodicus nigripes Ricardo.

Philodicus nigripes Ricardo, 1925, *Ann. Mag. nat. Hist.* (9) **15** : 237.

A rather small insect, length 17–22 mm., wing 10·5–13 mm., similar in general appearance to *P. temerarius* but distinguished by the lesser amount of wing shading.

Holotype ♀, NYASALAND : Mt. Mlanje, 18.xii.1912 (*S. A. Neave*). British Museum (Nat. Hist.).

Paratypes 2 ♀, UGANDA : Eastern Mbale District, South of Mt. Elgon, 2–5.viii.1912 (*S. A. Neave*). British Museum (Nat. Hist.).

Paratype ♂, S. RHODESIA : Bulawayo ; ♀, Hope Fountain. Rhodesia Museum (not seen).

Other material has been seen from Salisbury, S. Rhodesia and from Mt. Chirinda, Gazaland.

Philodicus fraterculus (Walker).

Trupanea fraterculus Walker, 1855, *List Dipt. Brit. Mus.* 7 Suppl. 3 : 597.
Promachus fraterculus Kertesz, 1909, *Catalogus Dipterorum* **4** : 220.

The single female type specimen is in the British Museum (Nat. Hist.). labelled "Port Natal" (Durban).

A small, rather slender insect, length 17·5 mm., wing 10·5 mm., very strongly resembling *P. nigripes* ; the legs are brown and black instead of all black, but this is not a very important character ; the eighth sternite shows some differences, but appears worn.

Unfortunately there is no more material of this species in Durban Museum, so its distinction from *P. nigripes* must be left open to question.

Philodicus nigrescens Ricardo.

Philodicus nigrescens Ricardo, 1921, *Ann. Mag. nat. Hist.* (9) **8** : 181.

A medium-sized species, length 16·5–24 mm., wing 11–15 mm., easily recognised by its black legs and its wing shading extending to M_3. The general colour is rather dusky.

Syntypes ♂, ♀, S. CONGO : Lualaba River, 26.vi.1907 (*S. A. Neave*).

Specimens have been seen from Lualaba River, S. Congo, and from Zungeru, N. Nigeria, both in tropical grassland areas.

Philodicus temerarius (Walker).

Trupanea temeraria Walker, 1851, *Insecta Saunders. Dipt.* 1 : 121 ; 1855, *List Dipt. Brit. Mus.* 7 Suppl. 3 : 596.
Promachus temerarius Loew, 1860, *Dipt.-Fauna Südfrika's* **1** : 127.
Philodicus temerarius Ricardo, 1921, *Ann. Mag. nat. Hist.* (9) **8** : 179.

Philodicus obscuripes Loew, 1857, *Öfvers. VetenskAkad. Förh., Stockh.* **14** : 361 ; *Dipt.-Fauna Südafrika's* **1** : 139 ; *teste* Ricardo, *loc. cit.*
Alcimus aethiopicus Bigot, 1891, *Ann. Soc. ent. Fr.* (7) **1** : 371 **syn. nov.**
Rhadiurgus notatus Bigot, *loc. cit.* **syn. nov.**
Alcimus brachypteratus Bigot, MS. in coll. **syn. nov.**
Philodicus walkeri Ricardo, 1921, *Ann. Mag. nat. Hist.* (9) **8** : 180 **syn. nov.**
Alcimus biseriatus Curran, 1927, *Amer. Mus. Novit.* **272** : 16 **syn. nov.**

A dark insect with black legs and dense extensive apical shading on the wings. Very variable in size, length 12·5–26 mm., wing 8·5–15 mm. The large amount of dense wing shading is sufficient to distinguish this species from all others except *P. furunculus*, which is without the metapleural bristle.

Holotype ♂, "SENEGAL". British Museum (Nat. Hist.).

To judge by its frequency in collections this must be a very abundant and widespread species within its range, which corresponds exactly with the distribution of the Tropical Rain Forest. This abundance may account for the number of times that it has been described as new or placed in collections incorrectly named.

Philodicus furunculus sp. n.

A small, totally black species with silvery-grey and brown tomentum, and very heavy and extensive wing shading. Length 11–22·5 mm., wing 7–13 mm.

Holotype, length 11 mm., wing 7·5 mm. Ground colour entirely black except the extreme bases of all tibiae brown.

Head.—Tomentum grey, becoming yellowish dorsally; vibrissae yellowish-white, a few weak black bristles laterally; facials very scanty and fine, whitish; frontals black; postorbitals black medially, white laterally. Antennae with grey tomentum, segments 1 and 2 with all black bristles; segment 2 about half the length of 1, 3 equal to 1 + 2, style slightly shorter. Palpi with yellow hairs.

Thorax.—Pronotum with brownish-grey tomentum; bristles black, one yellowish. Mesonotum with yellowish-grey tomentum, becoming grey posteriorly, grey on the scutellum; centre stripes dark brown, well separated by a broad lighter brown medial band; lateral spots well defined, intense sooty black except the anterior one which is indistinct, although rather dark sooty laterally; pubescence black except on the scutellum and in 3 small patches anterior to the post-alar calli and in the middle of the posterior edge of the disc; pleura with greyish-white tomentum, brownish on the dorsal half of the mesopleura; pubescence black on the mesopleura, elsewhere very scanty, white; bristles yellowish, metapleural bristle absent.

Legs.—Bristles black, a few scattered ones yellowish; a conspicuous row of yellowish bristles along the posteroventral side of the fore tibiae and tarsi.

Wings.—Veins yellowish-brown to black; membrane without yellowish tinge; grey apical shading very dense and extensive, covering most of the posterior half of the wing as well as the apex. Apparent origin of R_4 about equidistant from each of the 2 cross-veins.

Abdomen.—A band of brown tomentum on each segment, leaving the lateral and posterior margins light grey; pubescence whitish with a median anterior patch of black on each segment; claspers with long black hairs dorsally, whitish ones ventrally; yellowish bristles on the first 7 segments.

Holotype ♂, *allotype* ♀, SUDAN: Bahr-el-Ghazal Province, Alel, Lakes District, 20–30.v.1954 (*P. Blasdale*). Hope Department, University Museum, Oxford.

Paratypes 3 ♂, 1 ♀, same data.

Paratypes ♂, ♀, SUDAN: Equatoria Province, Tali Post, Moru District, 30.v.1954 (*P. B.*).

The only species with which *P. furunculus* could be confused is *P. temerarius*, which has less extensive wing shading, almost invariably a black bristle among the white ones on each side of the first abdominal segment, the metathoracic bristle present, and a more brownish general appearance; it is usually considerably larger.

P. furunculus is abundant at the localities stated, which are on rather arid laterite with open low bush, short grass and little undergrowth. There are two specimens in the British Museum (Nat. Hist.) from the Congo, 150–200 miles west of Kambove: this appears to be an area of similar type to the Sudan localities.

The insects fly furtively, low down among the tussocks, resting on the ground and occasionally running short distances.

Philodicus ludens (Wiedemann).

Asilus ludens Wiedemann, 1828, *Aussereurop. Zweifl. Ins.* **1** : 572.
Alcimus ludens Schiner, 1866, *Verh. zool.-bot. Ges. Wien* **16** : 690.
Trupanea ludens Jaennicke, 1867, *Abh. Senckenb. naturf. Ges.* **6** : 366.

A small, pale, delicate species with almost all its bristles yellowish-white except those on the mesonotum. Length 13·5–16 mm., wing 8–8·5 mm.

Ground colour reddish-yellow, black on the vertex, occiput, disc of mesothorax, isolated patches on the pleura, and a large patch on each tergite of the abdomen ; anterodorsal side of femora and an anteroventral line on the tibiae, dark red.

Head.—Tomentum silver, slightly yellowish on the vertex ; vibrissae white, one black on each side ; facials rather numerous, stout, white ; frontals white ; postorbitals yellowish medially to white laterally.

Thorax.—Pronotum with yellowish-silver tomentum, yellowish-white bristles. Mesonotum with light greyish-yellow tomentum ; centre stripes brown, transversely striated, fading in the posterior third ; the reddish ground colour of the thorax showing as a streak between them expanding to a broad wedge anteriorly ; the posterior lateral spot elliptical, black, mid one faint brownish-grey, anterior one scarcely discernible ; pubescence black on the disc, whitish on the posterior and lateral sides, 4 calli and scutellum ; all bristles black ; pleura with yellowish-silver tomentum, yellowish-white pubescence and bristles.

Legs.—Bristles all yellowish-white except a few at the apices of the femora and scattered on the tibiae, about half those on the fore and mid-tarsi, and most of those on the hind tarsi, black.

Wings.—Very delicate ; veins dark yellow ; apparent origin of R_4 nearer to the first cross-vein than to the second ; membrane clear and iridescent ; grey apical shading pale and indistinct, but extending into all cells of the posterior margin.

Abdomen.—Tomentum yellowish-grey on segment 1 and the lateral and posterior borders of segments 2–6, elsewhere brown dorsally with an indistinct dull grey medial line ; pubescence whitish laterally and posteriorly, black anteriorly with a proportion of hairs increasing posteriorly so that segment 7 has all whitish pubescence ; segment 8 with all whitish except a row of black hairs along the posterior margin ; bristles all yellowish-white on the first 7 segments ; claspers with yellowish-grey tomentum and whitish hairs except mid-dorsally where there is brown tomentum and black hairs.

Paratypes seen, ♂, ♀, ABYSSINIA : (*Dr. Rüppell*). Senckenbergische Naturforschende Gesellschaft, Frankfurt a. M. Det. Dr. F. Herman (sic).

The redescription is based on the male specimen.

Its small size and pale, delicate appearance make this an easily recognised species.

The only specimens seen were from Abyssinia, and the type locality is stated in the original description as " Nubia ".

V. SUMMARY.

The Ethiopian species of the genus *Philodicus* are keyed and divided into two species groups, the *alcimoides* group and the *fraternus* group. Of the twenty species mentioned, seven are described as new and two species are redescribed. In view of the unreliability of previous determinations, the distribution of each species is tentatively suggested on the basis of the material examined.

VI. References.

Bezzi, M., 1892, Di alcuni Ditteri raccolti nel paese dei Somali dall'Ingegnere L. Brichetti Robecchi. *Ann. Mus. Stor. nat., Genova* (2) **12** : 181–96.

Bigot, J. M. F., 1858, Insectes Diptères pour servir à la faune du Gabon. *In* Thomson *Arch. ent.* **2** : 346–76.

—— 1891, Voyage de M. Ch. Alluaud dans le territoire d'Assinie (Afrique occidentale) en juillet et août 1886. 8e mémoire. Diptères. *Ann. Soc. ent. Fr.* **60** : 365–86.

Curran, C. H., 1927, Undescribed Asilidae from the Belgian Congo. *Amer. Mus. Novit.* **272** : 1–18.

Hobby, B. M., 1933, Descriptions of new Rhodesian Asilidae (Dipt.). *Ent. mon. Mag.* **69** : 108–12.

Jaennicke, F., 1867, Neue exotische Dipteren. *Abh. Senckenb. naturf. Ges.* **6** : 311–408.

Kertesz, C., 1909, *Catalogus Dipterorum hucusque descriptorum* **4**. Budapest.

Loew, H., 1857, Bidrag till Kännedomen om Afrikas Diptera. *Öfvers Vetensk-Akad. Förh., Stockh.* **14** : 337–83.

—— 1860, Die Dipteren-Fauna Südafrika's. 1. *Abh. Naturw. Ver. Sachs Thür.* **2** : 57–402.

Macquart, P. J. M. 1839, Diptères exotiques nouveaux ou peu connus. 1 (2). *Mém. Soc. Sci. Lille* **1838** (3).

Ricardo, G., 1900, Note on Diptera from South Africa (Tabanidae and Asilidae). *Ann. Mag. nat. Hist.* (7) **6** : 161–78.

—— 1921, Notes on the Asilinae of the South African and Oriental regions. *Ibid.* (9) **8** : 175–92.

—— 1925, New species of Asilidae from South Africa. *Ibid.* (9) **15** : 234–82.

Schiner, J. R., 1866, Die Wiedemann'schen Asiliden. *Verh. zool.-bot. Ges. Wien* **16** : 649–722.

Walker, F., 1849, *List of the specimens of Dipterous insects in the collection of the British Museum* **2**. London.

—— 1851, *Insecta Saundersiana, &c. Diptera.* Pt. II. London.

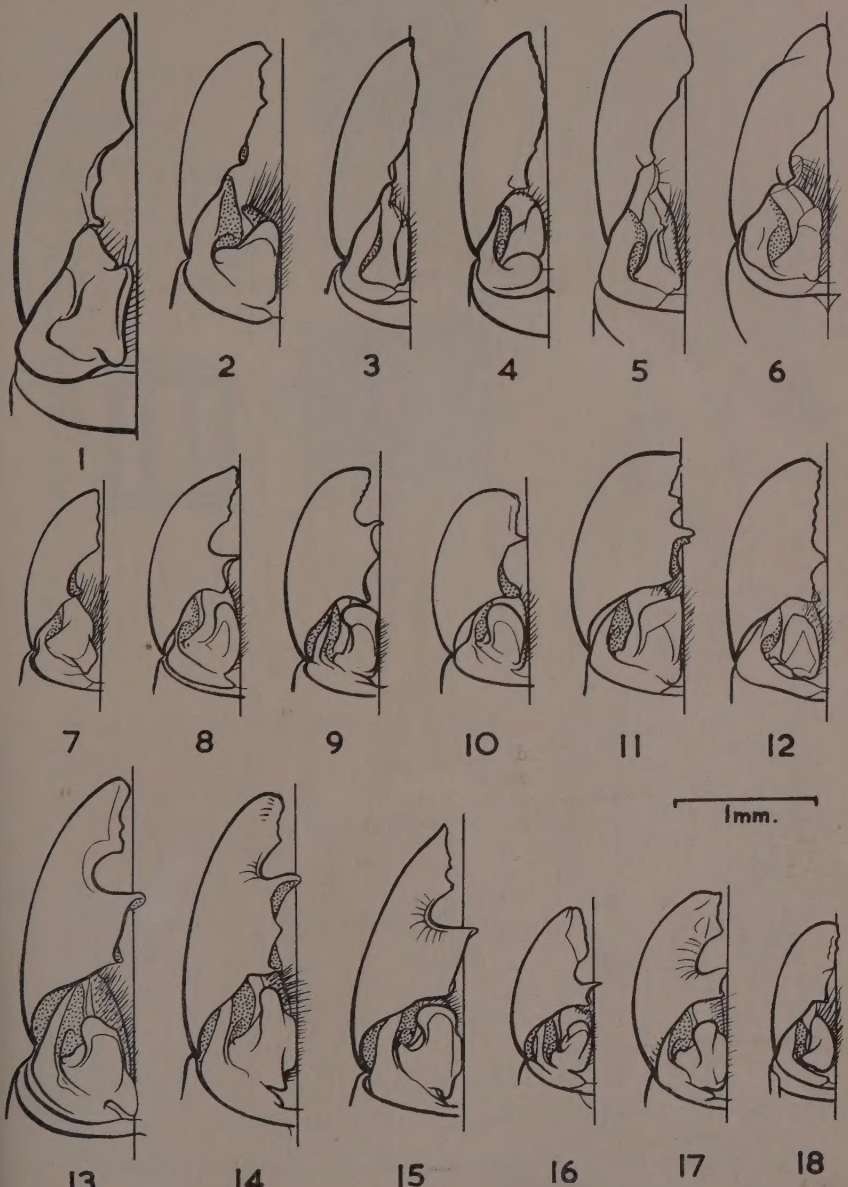
—— 1855, *List of the Specimens of Dipterous insects in the British Museum.* Pt. VII. Suppl. 3. London.

Wiedemann, C. R. W., 1819, Beschreibung neuer Zweiflugler aus Ostindien und Afrika. *Zool. Mag.* **1** (3) : 3–39.

—— 1821, *Diptera exotica* **1**. Kiliae.

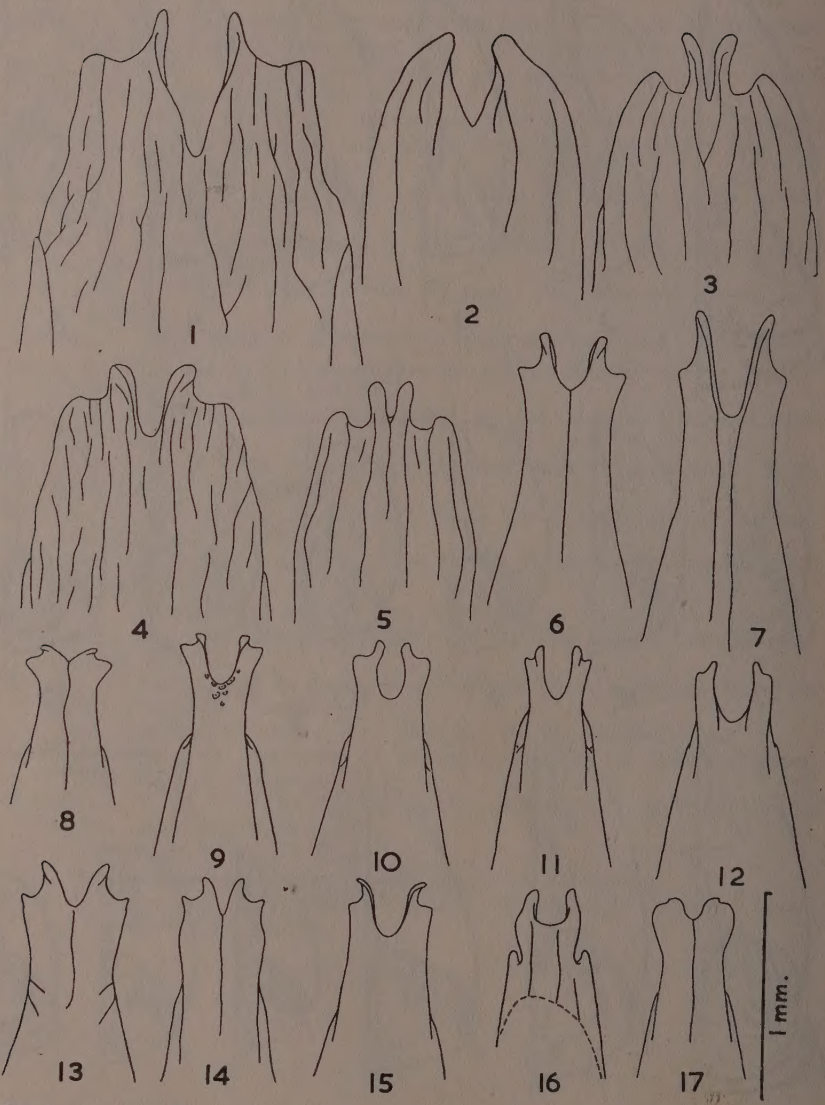
—— 1828, *Aussereuropäische zweilflügelige Insekten* **1**. Hamburg.

Wulp, F. M. van der, 1899, Asilidae from Aden and its neighbourhood. *Trans. ent. Soc. Lond.* **1899** : 81–98.



Left clasper and paramere of males of *Philodicus* species in ventral view. All drawn from type material except (6), (14) and (17).

(1) *dubius*. (2) *pallidus*. (3) *alcimoides*. (4) *gracilis*. (5) *cinerascens*. (6) *tenuipes*. (7) *nigripes*. (8) *nigrescens*. (9) *yirolensis*. (10) *fraternus*. (11) *palustris*. (12) *flavipes*. (13) *swynnertoni*. (14) *doris*. (15) *robustus*. (16) *furunculus*. (17) *temerarius*. (18) *ludens*.



Eighth sternite of females of *Philodicus* species in ventral view. All drawn from type material except (3), (7) and (11).

(1) *dubius*. (2) *alcimoides*. (3) *tenuipes*. (4) *cinerascens*. (5) *gracilis*. (6) *swynnertoni*. (7) *doris*. (8) *nigripes*. (9) *nigrescens*. (10) *yirolensis*. (11) *fraternus*. (12) *palustris*. (13) *robustus*. (14) *furunculus*. (15) *temerarius*. (16) *ludens*. (17) *fraterculus*.